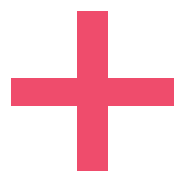


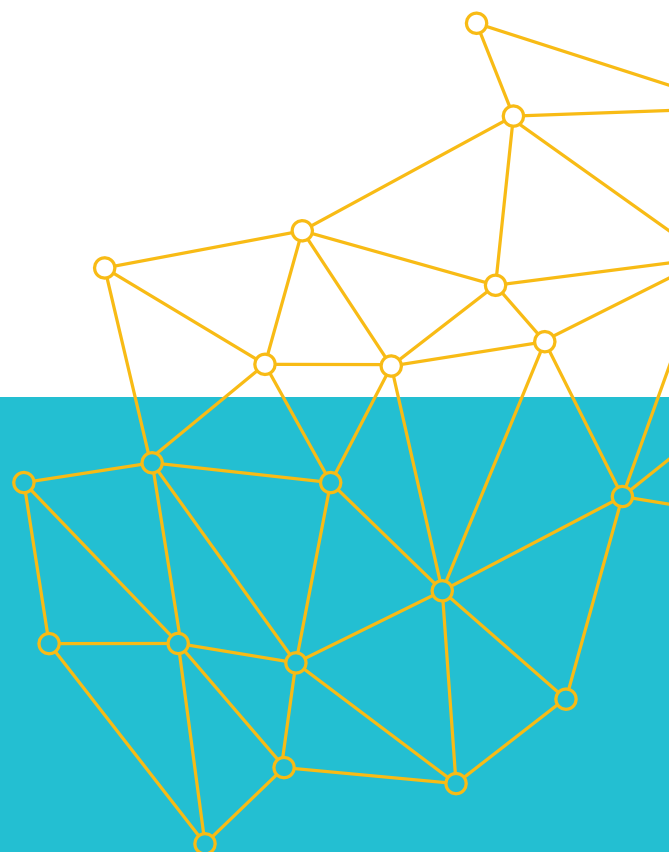
retrace



Systemic Design Method Guide for Policymaking:

**A Circular Europe
on the Way**

volume 1



**Edited by
Silvia Barbero**

Allemandi



SYSTEMIC DESIGN
METHOD GUIDE
FOR POLICYMAKING
A Circular Europe on the Way

EDITED BY
SILVIA BARBERO

Allemandi

SYSTEMIC DESIGN METHOD GUIDE FOR POLICYMAKING: A CIRCULAR EUROPE ON THE WAY

Edited by

Silvia Barbero

Preface by

Erwin Siweris

RETRACE Coordinator

Politecnico di Torino (Italy)

RETRACE Partners

Piedmont Region (Italy)

Azaro Foundation (Spain)

Beaz Bizkaia (Spain)

Higher School of Advanced Industrial Technology / ESTIA (France)

Association for Environment and Safety in Aquitaine / APESA (France)

Government Office for Development and European Cohesion Policy (Slovenia)

North-East Regional Development Agency (Romania)



Chief Editor

Silvia Barbero

Assistant Editor

Carolina Giraldo Nohra

Authors

Jocelyn Bailey

Cyril Baldacchino

Silvia Barbero

Chiara Battistoni

Luigi Bistagnino

Emanuele Bompan

Daniel Calleja Crespo

Tiziana Dell'Olmo

Marjana Dermelj

Carolina Giraldo Nohra

Jean-Michel Larrasquet

Iban Lizarralde

Ander Muñoz Urbizu

Agnese Pallaro

Pier Paolo Peruccio

Estibaliz Plaza Elordi

Marion Real

Ramona Tanasă

Paolo Tamborrini

Benjamin Tyl

Cover Design

Carolina Giraldo Nohra

Annexes Design

Chiara Battistoni

Carolina Giraldo Nohra

First Edition

ISBN 978-88-422-2444-0

© 2017 BY RETRACE PROJECT

© 2017 UMBERTO ALLEMANDI SRL

PRINTED IN TURÍN IN THE MONTH OF SEPTEMBER 2017
FOR THE UMBERTO ALLEMANDI PUBLISHING HOUSE

All rights reserved

No part of this publication may be reproduced in any manner without permission.

This publication is possible thanks to the support of Interreg Europe and the European Regional Development Fund (ERDF) in the RETRACE Project.

www.interregeurope.eu/retrace

This publication reflects the authors' views only and the Interreg Europe programme authorities are not liable for any use that may be made of the information contained therein.

Table of Contents

9	Introduction	SILVIA BARBERO
1. Transition Towards a Circular Economy		
14	1.1 The Circular Economy Package. Beginning of the Transition towards a more Circular Economy	DANIEL CALLEJA CRESPO
16	1.2 Circular Economy: Definition and Evolution. Principles and Development	EMANUELE BOMPAN
24	1.3 The Transition of European Countries Toward a New Economy and the Role of Regions	TIZIANA DELL'OLMO
35	1.4 Evolution of Interreg Europe Projects on Circular Economy	MARJANA DERMELJ
43	1.5 Elements of Novelty: Designer as Policy-Maker	JOCELYN BAILEY
51	1.6 Sustainable and Collaborative Innovation for the Territory	PAOLO TAMBORRINI
2. Systemic Design: A Tool for An Emerging Sustainable Future		
58	2.1 A Complementary View on Complex and Systemic Approaches	MARION REAL, JEAN MICHEL LARRASQUET AND IBAN LIZARRALDE

68	2.2	Systemic Design: A Historical Perspective PIER PAOLO PERUCCIO
75	2.3	Systemic Design: Methodology and Principles LUIGI BISTAGNINO
83	2.4	Systemic Design as Effective Methodology for the Transition to Circular Economy SILVIA BARBERO
	3.	The RETRACE Project
92	3.1	Overview of the RETRACE Project RAMONA TANASĂ
101	3.2	Involved Actors CYRIL BALDACCHINO AND BENJAMIN TYL
	4.	The Methodology of the RETRACE Project
112	4.1	Exchange of Experiences CHIARA BATTISTONI, CAROLINA GIRALDO NOHRA, AGNESE PALLARO AND ANDER MUÑOZ URBIZU
135	4.2	Communication and Dissemination ESTIBALIZ PLAZA ELORDI, MARION REAL AND MIKELE LARRONDE
140		Conclusion SILVIA BARBERO
143		Annexes
179		Glossary
185		Authors' Biographies

4.1 Exchange of Experiences

This chapter aims to explain the methodology and performance of the Exchange of Experience activities. For this purpose it has been divided in the following three segments:

- ✓ *The RETRACE Holistic Diagnosis. This part illustrates the role of Systemic Design as a tool for performing the Holistic Diagnosis in the context of each partner, achieving results that will allow to develop policy roadmaps.*
- ✓ *Good Practices and Field Visits. This section describes the research methodology based on the identification and selection of the Good Practices that have been applied during the project and how they have been developed during the field visits.*
- ✓ *Action Plan and Policy Brief. This segment defines the principal characteristics that must be considered when elaborating an Action Plan and a Policy Brief, giving a wide overview of the full methodology applied in the RETRACE Project.*

4.1.1 THE RETRACE HOLISTIC DIAGNOSIS

CHIARA BATTISTONI AND CAROLINA GIRALDO NOHRA

Placed at the foreground of the Systemic Design Approach methodology, the Holistic Diagnosis is a tool that evaluates the context of a project through different levels of analysis (economic, socio-cultural and environmental) to define the current state-of-the-art. Applied to the RETRACE Project, it was performed during the three main steps of the analysis. The intention of this chapter is to explain the meaning of this specific tool, show its application in the RETRACE Project and elaborate considerations on its value in the creation of better policy roadmaps.

Systemic Design as a Tool for Holistic Diagnosis

The RETRACE research methodology is based on the Systemic Design approach¹, which in its first phase has at the foreground the Holistic Diagnosis (HD) tool (Bistagnino, 2011). Defined as a process of analysis that aims to determine the context of a system and its state-of-the-art. This allows to highlight the connections between system components and provide as an output an accessible support for the interpretation of data (Gaiardo, 2016).

This tool is executed through different means of investigation at economic, socio-cultural and environmental level. It is developed by different phases, which enable the collection of qualitative and quantitative data, followed by the analysis of interactions between them (fig. 1).

The HD is performed through three phases (Barbero, 2016): desk and field research are dedicated to the collection of quantitative and qualitative information through different methods while the last phase is dedicated to the analysis of the collected data.

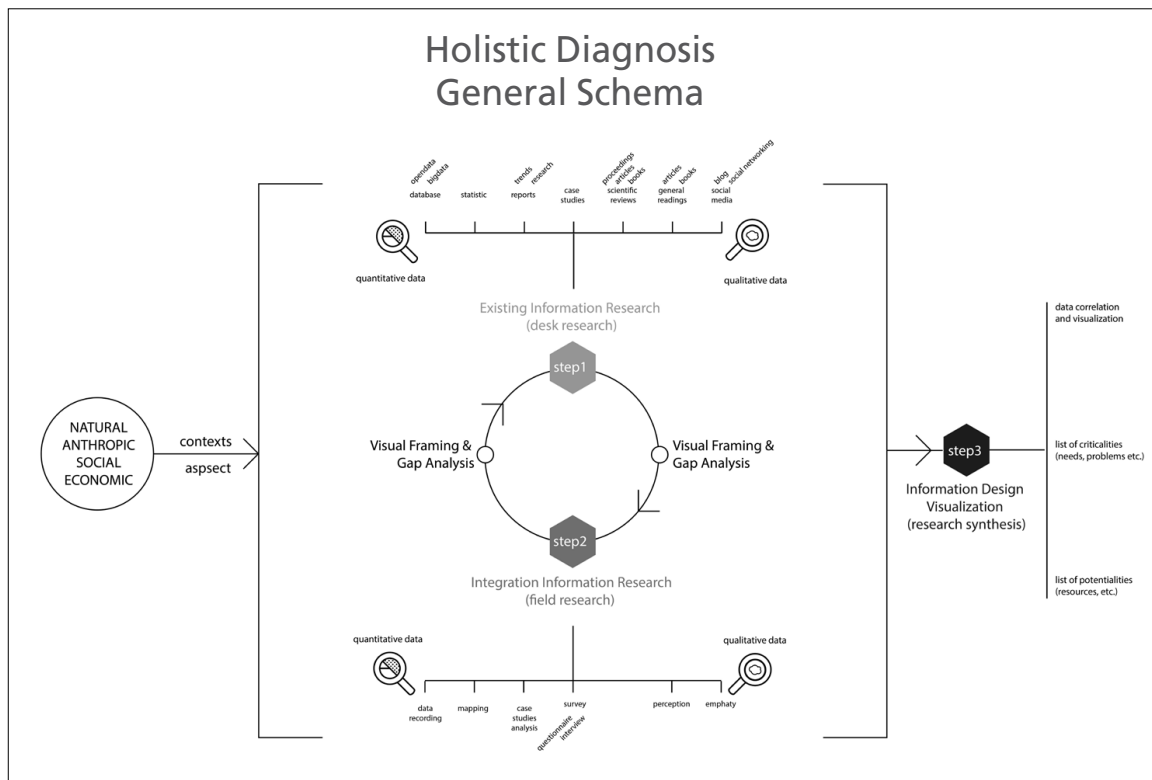


Fig. 1. General schema of Holistic Diagnosis. (Gaiardo, 2016). Courtesy of the author.

1. **DESK RESEARCH.** In this case the collection of information about the state-of-the-art is done through different sources: from existing literature, official databases and informal sources such as social media.
2. **FIELD RESEARCH.** Complementary to the previous phase, this analysis is done through direct experience in the field of reference, ranging from direct data recording to collection of perceptions (pictures, etc.).
3. **RESEARCH SYNTHESIS.** In this phase Information Design Visualization is used to ease the understanding of the collected data exposing controversial aspects, potentialities and data correlation. Thus, it is possible to start a project development and at the same time to communicate the research results to a second party (Barbero, 2016).

At this stage, the designers' intervention becomes a key element, which enriches the process through problem-solving and communication skills. Such tools are used for processing information. So the results become accessible to a wider public and do not only serve the specialists; they become an open source for the development of interdisciplinary projects. Nonetheless, during the data collecting process the designer meets with different specialists in order to certify their correct interpretation. Therefore, the HD is a process that requires an approach from different areas of knowledge to be able to manage complex data.

The HD is featured as a tool that can be adapted to different projects according to the nature of the project based on the methodology that offers the possibility of adding different elements to create an outline for each context.

The scope of a Systemic Design project is to analyse the diagnosis of production processes mainly focusing on the flows of energy and matter, defining the inputs and the outputs while determining relations inside the context of reference (territory).

Applied to the RETRACE Project, the HD phases has three main phases of analysis: the first phase starts with an analysis of the territorial context; the second phase continues to analyse current policies regarding regional policy axes related to CE and SD; the third and last phase focuses on the principal economic sectors where all the above mentioned aspects meet.

To recapitulate, the HD is divided in three steps:

1. Analysis of the regional framework;
2. Analysis of current policies;
3. Analysis of the principal economic and industrial sectors.

The Holistic Diagnosis: First Step

The first step of the HD relates to the analysis of the territorial framework from different points of view: from geographical aspects to demography, culture and economy. In the RETRACE Project, the geographical context of reference that is being considered is the entire region involved in the project: the Piedmont Region in Italy, Bizkaia in Spain, the North-east region in Romania, Nouvelle Aquitaine in France and the entire country of Slovenia.²

The research starts by considering the geographical location with a special focus on the following topics:

- ✓ *geographical location (borders, extensions...);*
- ✓ *morphological composition and features (percentage of mountains, hills, plains, rivers, coast, sea...);*
- ✓ *soil use (hectares dedicated to industry and commercial area, to agriculture and woods);*
- ✓ *agricultural area, indicating hectares dedicated to different types of crops (total agricultural area T.A.A, useful agricultural area U.A.A., etc.) and a focus on agricultural farms (quantity, average dimensions, type of management, type of cultivations);*
- ✓ *Breeding area with the number of heads and a focus on farms (quantity, average head, type of management, type of breeds).*

The data that are studied come from agricultural and geographical censuses, and are based on morphological features and natural resources (with a focus on quantity). After processing this information, the result is a clear overview of where to operate within the territory. It also highlights how the land is mostly being used and which activities are being executed. This study aims to have a perspective on the dimensions of artificial and agricultural land, on man's intervention on the natural environment and how he has managed it over the years.

Afterwards, the HD analysis continues with demography, thus the attention shifts to the territory's population. This research is developed with two different criteria: first, the collection of general information on the inhabitants and subsequently, a focus on employment, education and migration.

The collected data are related to:

- ✓ population features (numbers of inhabitants, density of population and its distribution on the territory, average age, nativity and mortality rate, number of men and women, average age when children leave their parent's home);
- ✓ family (numbers of unit, average number of people in a family, type of family, number of adopted children);
- ✓ marital status (number of marriages and divorces, type of marriage);
- ✓ focus on employment (rate of employment and unemployment, average income per year and per type of job);
- ✓ focus on education (schooling rate, vocation of studies and number of education levels and units);
- ✓ focus on temporary and definitive migration (rate of migration and destination countries, rate of immigration and countries of origin).

The analysis of demographic data comes from demographic censuses, which allow a better understanding of the territory and life quality. This interpretation reaches a further level of analysis based on the reading of specific data; for example, life expectancy and average income can help to determine the size of the population or schooling rate with the number of educational units can affect future job opportunities among the population. Other data can be interpreted based on higher education levels and study vocation which in most cases reflect the needs of the industry. Another element is the regional population density, which can be analysed and helps to understand the distribution in urban centres.

These indicators are mostly revealing regarding the workforce offer of a region. A clear visualization of the information facilitates finding relationships. For example, the level of employment and unemployment related to the rate of emigration and immigration can reveal the quality and the quantity of the existing job market related to the economical situation of a territory.

The analysis of the economical aspects aims to give an overview of the current industrial situation of a territory. After analysing the main economical sectors and their corresponding turnovers (services, constructions, farming...), the focus is addressed to the manufacturing sector, which is analysed according to:

- ✓ total number of units and number of units for principal typologies;
- ✓ internal organization (cooperatives, one-man companies...);
- ✓ size (micro, small, medium or large) and number of employees of each type;
- ✓ focus on the area of innovation with the number of units and principal enterprises.

This general study of the industrial fabric presents indexes of the regional main production processes. Such results are used as measuring instruments, which give a view of the weak and strong sectors. As a matter of fact, the data about the number of people employed illustrates the wellbeing of society. In this context, is important to highlight the increasing role of micro enterprises as a growing working force. The analysis shifts then to areas of innovation, which are represented by the industrial sectors where current policies are already operating.

Eventually, there are the cultural aspects, which are key to understand some specific phenomena in each region. The study focuses on the following aspects:

- ✓ general cultural aspects: languages, religions, influences (from other countries), principal traditions, folklore/music (instruments and dances);
- ✓ notable residents (one from literature, music or art and the other from business, politics or religion);
- ✓ culture related to food (traditions, most popular dishes and recipes, principal food resources and their location on a map);
- ✓ architecture (principal landmarks and their location, style and urban pattern) and crafts (principal products and craft districts with their location).

The research on cultural aspects shows the influence of the civilizations, which have inhabited the territory and how they have shaped demographical and economical aspects. For this reason, the analysis starts from the study of foreign influences, languages and major religions that are present in the context.

By considering these aspects it is possible to understand the population configurations (for example, the French influence in past centuries over the Piedmont region, or the strong feeling of belonging to the Basque community, or the strong Austro-Hungarian legacy in Slovenia, or the Communist past in Romania).

Another relevant aspect is the presence of notable residents, who strongly influenced a specific geographical area or promoted certain sectors such as culture, economy, politics, religion or science. These influencers are key to understand current developments in several areas such as universities, industries and governments.

An important matter concerning material culture is the architectural legacy, which translates the history of a territory into the urban fabric, reflecting diverse economic periods and showing the importance of contemporary urban centres. In the same way, this can be seen in the landmarks and craft districts spread along the territory. Moreover, the material culture related to the evolution of crafts which is a testimony of the knowledge of techniques and different materials that have been developed over the centuries by the population.

The same approach can be applied to food culture: particular dishes can tell a story about food resources that are available and the influences of past civilizations. Likewise, climate is an important factor regarding food, which influences variety and availability of resources (prevalence of cold dishes in warm period; dishes that need more time to cook in cold periods). The presence of typical dishes can be also related to particular events like festivals or holiday.

The analysis of cultural aspects and their representations can reveal existing differences within areas of a same regions. Most of these differences are related to the geographical location (proximity to another country) or the morphological aspects (mountain area, hills area, plain area). It is possible to find other important differences in rural areas as well as in urban centres concerning demography and economical performance. For this reason, HD step 1 studies the three major urban centres of each territory. The main aim of this is to understand their evolution over the years and current configuration. The analysis has focused on:

- ✓ principal historical events;
- ✓ inhabitants and their features (total number, percentage of men, women and immigrants);
- ✓ geographical location and principal landmarks;
- ✓ principal cultural events and religions;
- ✓ focus on economic sectors (number of employees, number of companies and principal typologies);
- ✓ principal services (infrastructures and number of universities).

The following results show how from a holistic point of view the system interactions of a context can create enough materials for the development of new strategies fostering circularity.

MANAGEMENT

The RETRACE research was carried out by each region involved and required the collaboration between regional partners and local stakeholders. The raw data were collected at first stage in an Excel file which contained a database of different available sources. Afterwards, the data were processed by the designers of the Lead Partner (LP) team, who translated the information in different visual maps to facilitate an efficient visualization of the data. Some were interpreted with graphs others with images of reference. In order to put underline the relation with the territory features and the differences between geographical areas, some information was visualized directly on a geographical map, like the density of population or the distribution of food resources. This phase allowed to control the data one more time, thanks to the collaboration of the partners, and to reach a comparable level of completeness between all partners.

The Holistic Diagnosis: Second Step

For the second step of the HD, the main aim is the analysis of current policies. To achieve this, the LP required from each partner to focus on a deeper description of their own policy instrument. For this purpose, it was relevant to describe the main features of the policy instruments in relation to their objectives, characteristics, and priorities. Moreover, it was important to define the impact on performance indicators within the territory achieved by the measures of the policy concerned. This was important in order to highlight the strengths and weaknesses.

These facts lead to an accurate description of the state-of-the-art addressed by the policy instruments on each territory while highlighting the results that these policy instruments have already generated. Afterwards, each partner was able to envision the potential improvements of their own policy instrument through the proposal of new projects, improved governance or structural changes.

As a matter of fact, RETRACE has as main pillars the Systemic Design (SD) Approach and Circular Economy (CE) vision, guiding the analysis towards policy instruments that address traditional sectors on environmental sustainability such as: water management, urban waste, energy and environment. However, it is important to take into account that each context presents different industrial realities and territorial development. This consideration also draws attention to other policy instruments that can address other industrial sectors (e.g. elements related to production processes) which also foster the SD and CE.

The result of these indicators is to show the state-of-the-art of local policies regarding sustainability and circular economy orientated to each territory.

After the depiction of this policy scenario, it was relevant to review the previous step 1 in order for so each partner was able to confront analyse which aspects from his/her territorial situation could be improved. The overlapping of steps 1 and 2 revealed how some elements from the Holistic Diagnosis of the territory are not being considered as the current policy instruments in each region. This lead to envision the first approach of potential policy gaps of each territory. The aim of this step was to provide partners with a more detailed definition of the issues that needed to be addressed and to suggest possible improvements.

ANALYSIS OF CURRENT POLICIES

1. *Considering the Policy Instrument addressed in the RETRACE Project proposal, answer the following questions in a more detailed way than in the project proposal (in relation to circular economy):*
 - ✓ *Describe the mains features of this policy instrument (e.g. objective, characteristics, priority or measure concerned).*
 - ✓ *Describe the reason(s) why it should be improved.*
 - ✓ *How do you envisage the improvement of this policy instrument (e.g. through new projects supported, through improved governance, through structural change)?*
 - ✓ *In relation to the policy instrument addressed and after the more detailed analysis of the policy instrument, are you able to define a suitable performance indicator for the policy? (You can suggest an additional indicator different from what you mentioned in the proposal.)*
 - ✓ *What is the state of art addressed by this policy instrument in the territory? Which results has this policy instrument already generated?*
 - ✓ *What needs to be improved in the territorial situation described in Step 1?*
2. *Are water management, urban waste, energy and environment addressed in the Policy instrument identified in RETRACE Project proposal?*

If yes:

 - ✓ *In which way does the Policy Instrument consider these topics?*
 - ✓ *Does it consider or address circular economy in relation to the aforementioned topics?*
3. *Are any other topics related to circular economy (and/or able to influence it) included in the Policy instrument identified in the RETRACE Project proposal? (e.g. elements related to production processes)*

If yes:

 - ✓ *In which way does the Policy Instrument consider these topics?*
 - ✓ *In which way these topics can influence the circular economy?*

The Holistic Diagnosis: Third Step

In the third step of the HD, the main aim is to link the previous steps by overlapping the policy instruments and the context information. For this purpose, each region selected 3 productive industrial sectors from the highlighted ones in Step 1. This will assess potential synergies at a systemic level among other sectors or processes at a regional and interregional scale.

After identifying three industrial sectors and relating them to the policy instruments described in Step 2, each partner described their own regional policy axes relevant in these sectors. At this stage, it was important to consider that most partners pointed their Smart Specialization Strategy as their main policy instrument.

As a result, this point analysed the measures of the policy axes and how much they consider circular economy aspects. This first phase displayed the state-of-the-art on each industrial sector in relation to the regional policy instruments, revealing particular existing strengths and weaknesses.

Afterwards, for each sector (i.e. agri-food) was identified a specific sub-sector (i.e. cow breeding) particularly relevant for the region taken in consideration. The aim of this phase was to focus on particular industries, which the analysis wanted to have an impact on. To reach a more precise result it was required to carry out a deeper study of the data of each sector, regarding quantitative information related to the number of companies and employees. Such information shows the economic impact that the subsector has on the region and, in terms of policymaking, this is an indicator to consider as a measuring instrument.

This step provided further insights into the resources of each country by analysing quantitative and qualitative details. Moreover, following the SD methodology, it was relevant to analyse the type, the quality and the quantities of the inputs needed and of the outputs produced within the value chain of each sub-sector. The main aim of this was to highlight specific critical issues related to the quality or the management of the output and the input analysed, mostly dealing with sustainability. After reaching this stage on regards to the current situation of the subsectors and recalling the strengths and weaknesses of the regional policies axes identified in Step 2, it was possible to start identifying specific policy gaps.

Inside these priority industrial sectors it was important to highlight the policy gaps which raise awareness regarding the implementation of SD approaches and CE vision and those that could support the adoption of eco-innovation, eco-design and re-manufacturing practices, as well as identifying other policy gaps in relation to education and training on the skills needed for the transition towards a circular economy. This will allow each partner region to better target the nature and scope of good practices useful to the region, to be specifically assessed for their transfer of the Action Plan.

ANALYSIS OF ECONOMIC / INDUSTRIAL SECTORS

1. *Identify three economical, industrial sectors relevant for your region from HD1.*
2. *Identify the axes of regional policies that deal with these sectors from HD2 (all axes or just some of them).*
3. *Analyse the measures of these axes: do they consider or address CE?*
4. *For each sector identified (i.e. agri-food), identify a specific sub-sector (i.e. cow breeding) particularly relevant for your region.*

5. *For each subsector identify:*
 - ✓ *the number of companies;*
 - ✓ *the number of employees;*
 - ✓ *the type, quality and quantity of input needed;*
 - ✓ *the type, quality and quantity of output produced.*
6. *Highlight specific critical issues related to the output or input analysed.*
7. *Identify policy gaps, analysing the strengths and weaknesses of these axes and comparing the data collected on the sub-sector with the policies identified in HD2.*

Holistic Diagnosis Outcome Review

The results of the HD steps are reported in the ensuing chapter HD report, where all information from the three Steps is presented in a synthetic way, showing the effective results of the tool. A section for each country partner has been created and provides an overview of the state-of-the-art of the territory and of the policy instrument related to it.

These documents are the basis for the definition of the Regional Action Plans, which will be defined in the following semester (in Fall 2017). The HD is a tool that helps the creation of better policy roadmaps giving the policymaker and other stakeholders the instruments for a more efficient decision-making. These results allow a closer approach to the real needs of the territory. Such approach is inspired by design according to which the starting point is the context or individuals needs. The SD methodology gives the designer the role of mediator among the different actors involved in the process.

As RETRACE's main goal is to facilitate the transitions of regions towards a CE, HD is the first tool that enables the application of a systemic approach. This represents a different way to tackle environmental and economic challenges. Through the HD analysis it is possible to reach a wider perspective of each territory involved in the project. This method of analysis achieves a deeper understanding based on an interdisciplinary point of view that reflects a holistic approach.

It is important to add that the analysis of the regional framework in Step 1 of the HD is part of the traditional method of the systemic approach. The application of the HD tool to the RETRACE Project has enlarged the analysis of the state-of-the-art, not only to geographical, economical and cultural aspects but also to regional policies; and this represents a novelty.

The studies followed the same methods suggested by SD, underlying their strengths and weaknesses. The traditional HD methodology was also applied to the analysis of the industrial and economic sectors focusing on the input and the output involved in the productive processes, in order to highlight once more strengths and weaknesses.

This tool is intended to help policymakers to promote better governance and decision-making. This is a first step towards the adoption of SD as a method focusing on a territorial and regional policy perspective as well as on systemic approaches for a CE. Above all, it will allow to achieve a sustainable future.

© 2017 UMBERTO ALLEMANDI, TURIN

© 2017 THE AUTHORS

PUBLISHED AND PRINTED IN TURIN IN THE MONTH OF SEPTEMBER 2017
BY UMBERTO ALLEMANDI PUBLISHING

This volume aims at clarifying the role of Circular Economy according to a sustainable development and how policymakers can target it effectively in their activities. It is a guide to Systemic Design as a key methodology to establish sustainable regional action plans towards a Circular Economy.

As the result of an intense dialogue between people who present different perspectives and seek for a common language in the current complexity of policymaking and designing, this is the first of a three book series published across a four-year period (2016–2020) as part of the RETRACE Project funded by the Interreg Europe Programme.

Preface by Erwin Siweris

With contributions by

Jocelyn Bailey / Cyril Baldacchino /
Silvia Barbero / Chiara Battistoni /
Luigi Bistagnino / Emanuele Bompan /
Daniel Calleja Crespo /
Tiziana Dell’Olmo / Marjana Dermelj /
Carolina Giraldo Nohra /
Jean-Michel Larrasquet /
Iban Lizarralde / Ander Muñoz Urbizu /
Agnese Pallaro / Pier Paolo Peruccio /
Estibaliz Plaza Elordi / Marion Real /
Ramona Tanasă / Paolo Tamborrini /
Benjamin Tyl

volume 1

ISBN 978-88-422-2444-0



9 788842 224440

Partners



POLITECNICO
DI TORINO
Dipartimento di
Architettura e Design



REGIONE
PIEMONTE



azarofundazioa
Bizkaia
basque



APESA
ESTIA
INSTITUTE OF TECHNOLOGY



REPUBLIC OF SLOVENIA
GOVERNMENT OFFICE FOR DEVELOPMENT
AND EUROPEAN COHESION POLICY



ADRI
Agencia para a Inovação Regional
N O R D - E S T